Ofqual

Guidance

GCSE (9 to 1) Subject Level Guidance for Computer Science

June 2019

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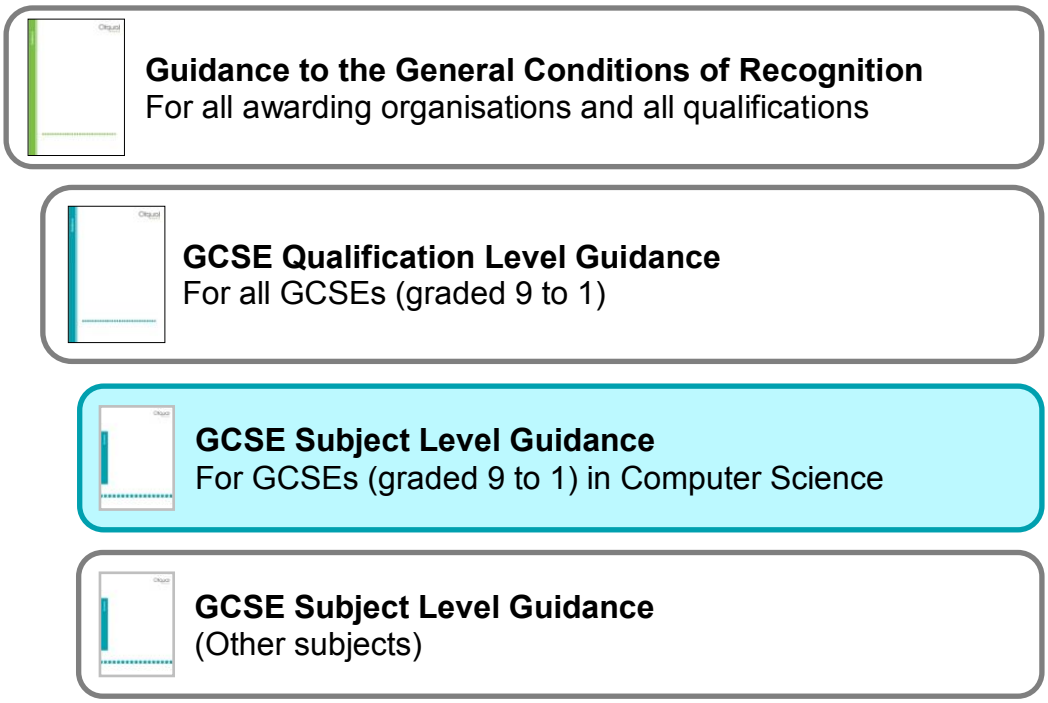
Contents

Introduction

This document (highlighted in the figure below) is part of a suite of documents which outlines our guidance for awarding organisations offering GCSE qualifications (graded from 9 to 1).



This document sets out guidance which applies to all GCSE Qualifications (graded from 9 to 1) in Computer Science. It supports the *GCSE Subject Level Conditions and Requirements for Computer Science*.[1]

This document constitutes guidance for the purposes of section 153 of the Apprenticeships, Skills, Children and Learning Act 2009 (the '2009 Act') and Condition GCSE(Computer Science)1.

An awarding organisation has a legal obligation under the 2009 Act to have regard to this guidance, where relevant, in relation to each GCSE Qualification in Computer Science that it makes available or proposes to make available. Condition GCSE(Computer Science)1 imposes the same obligation in respect of the guidance below which is issued under that Condition.

[1] www.gov.uk/government/publications/gcse-9-to-1-subject-level-conditions-and-requirements-for-computer-science

An awarding organisation should use the guidance in this document to help it understand how to comply with the *GCSE Subject Level Conditions and Requirements for Computer Science*.

Guidance set out in this document

This document provides guidance on assessment objectives for GCSE Qualifications (graded 9 to 1) in Computer Science.

Revisions to this document

We have revised this document since it was originally published (see Appendix 1 for details), most recently in June 2019.

The June 2019 version of this document replaces all previous versions of *GCSE Subject Level Guidance for Computer Science* with effect from 12.01 am on 26 June 2019.

Guidance on assessment objectives for GCSE Qualifications in Computer Science

Condition GCSE(Computer Science)1.2 allows us to specify requirements and guidance relating to assessment objectives for GCSE Qualifications in Computer Science.

We published our requirements in relation to assessment objectives in *GCSE Subject Level Conditions and Requirements for Computer Science*, and reproduce them in the table below.

	Objective	Weighting
AO1	Demonstrate knowledge and understanding of the key concepts and principles of computer science.	*30%*
AO2	Apply knowledge and understanding of key concepts and principles of computer science.	*40%*
AO3	Analyse problems in computational terms: ■ to make reasoned judgements ■ to design, program, evaluate and refine solutions.	*30%*

We set out below our guidance for the purposes of Condition GCSE(Computer Science)1.2. This guidance explains how we expect awarding organisations to interpret these assessment objectives in terms of:

- the different ‘strands’ within each of the assessment objectives;

- the discrete ‘elements’ within each assessment objective and its strands that questions and tasks could target and/or seek to credit – our expectation is that each and every question/task should target or seek to credit at least one of these elements, and may target or seek to credit multiple elements across one or more assessment objectives;
- the coverage expectations, such as in relation to the different elements within each assessment objective and how those elements should be sampled over time; and
- the key areas of emphasis in each assessment objective and the particular meaning for the subject of any key terms and phrases used; defined terms are shown in bold text, followed by their definitions.

In line with the obligations set out in Condition GCSE(Computer Science)1.2, we expect awarding organisations to be able to demonstrate how they have had regard to this guidance. For example, an awarding organisation could map how it has regard to the guidance as it:

- develops its sample assessment materials;
- delivers the qualification;
- develops and applies its approach to sampling the elements into which the assessment objectives are divided; and
- monitors the qualification to make sure it addresses all elements appropriately.

AO1: Demonstrate knowledge and understanding of the key concepts and principles of computer science.			*30%*
Strands	**Elements**	**Coverage**	**Interpretations and definitions**
n/a	1a – Demonstrate knowledge of the key concepts and principles of computer science. 1b – Demonstrate understanding of the key concepts and principles of computer science.	▪ Full coverage in each set of assessments[2] (but not in every assessment). ▪ No more than 15% of the total marks for the qualification should reward demonstrating knowledge in isolation.[3]	▪ In the context of this assessment objective, **demonstrate** means showing knowledge and understanding – for example, by stating or explaining a fact, concept or principle. ▪ **Key concepts and principles of computer science** are aspects of subject content. Awarding organisations should explain their approach to targeting them in their assessment strategy.

[2] For the purposes of this guidance, a 'set of assessments' means the assessments to be taken by a particular Learner for a GCSE Qualification in Computer Science. For clarity, the assessments taken by Learners may vary, depending on any possible routes through the qualification.

[3] Marks which 'reward demonstrating knowledge in isolation' means any mark awarded solely for recalling facts or other knowledge that is part of the specification. It does not include marks awarded for selecting appropriate knowledge (for example, to evidence an argument), or for applying knowledge to a particular context.

AO2: Apply knowledge and understanding of key concepts and principles of computer science.			*40%*
Strands	**Elements**	**Coverage**	**Interpretations and definitions**
n/a	1a – Apply knowledge of key concepts and principles of computer science. 1b – Apply understanding of key concepts and principles of computer science.	Full coverage in each set of assessments (but not in every assessment).	▪ In the context of this assessment objective, **apply** means using knowledge and understanding in a particular context or contexts. It includes both practical and theoretical contexts, and the use of computing-related mathematics within those contexts. ▪ **Key concepts and principles of computer science** are aspects of subject content. Awarding organisations should explain their approach to targeting them in their assessment strategy.

<table>
<tr><th colspan="3">AO3: Analyse problems in computational terms:
■ to make reasoned judgements
■ to design, program, evaluate and refine solutions.</th><th>30%</th></tr>
<tr><th>Strands</th><th>Elements</th><th>Coverage</th><th>Interpretations and definitions</th></tr>
<tr><td>1 – to make reasoned judgements.</td><td>This strand is a single element.</td><td rowspan="4">Full coverage in each set of assessments (but not in every assessment).</td><td rowspan="4">■ Analyse should involve deconstructing an issue so as to consider its component parts in terms that can be addressed through automated computation. It includes, but is not limited to, requirements analysis and the building of abstract models of real-world objects or phenomena.
■ Problems should be defined broadly to encompass tasks, goals or objectives.
■ Reasoned judgements means judgements based on a logical chain of thinking, which could link with applying knowledge and understanding.
■ Questions/tasks for elements 2a and/or 2b may use pseudo-code (or other suitable methods to represent algorithms) as well as the high-level programming languages detailed within an awarding organisation’s specification:
□ where pseudo-code is used as an intermediate stage it would be within element 2a; and
□ where pseudo-code is the final result it would be within element 2b.
■ Some of the activities within ‘testing’ (for example, constructing test data and carrying out test protocols) should be tested under this assessment objective, but others would fall under other assessment objectives as outlined below:
□ Describing test strategies would be within AO1 strand 1b.</td></tr>
<tr><td rowspan="3">2 – to design, program, evaluate and refine solutions.</td><td>2a – Design solutions.</td></tr>
<tr><td>2b – Program solutions.</td></tr>
<tr><td>2c – Evaluate and refine solutions.</td></tr>
</table>

AO3: Analyse problems in computational terms: ▪ **to make reasoned judgements** ▪ **to design, program, evaluate and refine solutions.**			*30%*
Strands	**Elements**	**Coverage**	**Interpretations and definitions**
			▫ Suggesting an appropriate test strategy to a given scenario would fall under AO1 or AO2, as appropriate to the question/task. ▪ Evaluating and refining solutions can be targeted in relation to: ▫ Learners' own or given solutions; ▫ designing and programming solutions; or ▫ other areas such as AO3 strand 1.

Appendix 1 – Revisions to this document

The table below sets out all revisions to this document since it was first published, and the dates on which those revisions came into force.

Revision	Date in force
Assessment Objective weightings only	26 June 2019
Requirements in relation to assessment by examination only	12 January 2018
Requirements in relation to assessment objective weightings	12 January 2018
First published	May 2015

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Office of Qualifications and Examinations Regulation
Spring Place
Coventry Business Park
Herald Avenue
Coventry CV5 6UB

Telephone 0300 303 3344
Textphone 0300 303 3345
Helpline 0300 303 3346